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Common Sports Injuries, Training Load and Treatment Strategies for Optimal Recovery in Female University Athletes

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ABSTRACT

The purpose of this study is to investigate the frequency, incidence, and types of sports-related injuries among female university athletes. As part of the examination, the study tries to establish the link between injury occurrence and factors such as age, training history, and specific sports events. It also intends to investigate the treatment and rehabilitation methods typically utilized for various athletic injuries. A structural questionnaire was used to collect data from 30 respondents who were chosen through a purposeful sampling strategy from the injured female athletes who trained in university level. Two primary qualitative data collecting methods used in the study were Focus Group Discussions (FGD) and Key Informant Interviews (KII). Handball, athletics, and volleyball exhibited the greatest injury rates (20%) among the 30 female university athletes. Knee ligament fractures were the most prevalent injuries (26.7%), with 57% of participants reporting moderate severity. The majority of cases (77%) were caused by direct injuries. Physiotherapy was the primary treatment for (63%) of injured athletes, with (47%) demonstrating improvement following therapy or medication. Trainees are significantly more relying on physiotherapy than on medication following an injury. In our study recommended that female athletes enhance their flexibility by practicing a thorough warm-up and cool-down, adhering to the diet chart and ensuring that they have a complete nutritional and water resistance. The study's findings illustrate the frequency of injury among female athletes, the characteristics of athletic injury and the factors that are associated with injury in female athletes.

1. INTRODUCTION

Women were not allowed to compete or even watch the ancient Olympics, according to the Greeks. Women were seen as weak, frail and passive throughout the Victorian era, according to Allred [1]. As a result, there were no female events at the first modern Olympian in 1896. Only two sports, tennis and golf, had female competitors at the Olympic Games in Paris in 1900. Yet recently, the number of women competing in the Olympic Games has constantly climbed. Throughout the past two decades, the involvement of female athletes in sports has grown [2]. Archaeological record revealed that physical activity and games existed across many societies and were subsequently linked to a variety of injuries [3]. Sports-related injuries are frequently brought on by overuse, direct collision, or the application of force that is larger than the body component can structurally handle [4]. Overuse of muscle groups or joints on a regular basis leads to chronic injuries. Chronic injuries can arise for a variety of reasons, including poor technique and structural irregularities [5]. The treatment of athletic injury is not done well in Bangladesh nowadays, despite the efficacy of sports physiotherapy [6]. Male and female athletes include anatomical, physiological and endocrinological differences, as well as variances in the frequency and kind of athletic injuries due to the genetic differences between the sexes [7]. In case of female need major concern about their height , weight and BMI as they are frail during to their adolescence time [8]. The goal of physiotherapy is to evaluate, diagnose and fully rehabilitate the athlete following injuries or surgery. The need for sports

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physiotherapy has expanded as a result of the widespread popularity of various sports on a national and worldwide level. A bright emphasis area in the rehabilitation of sports injuries, as per [9]. Sports physiotherapy is becoming more specialized as a result of recent basic research and meticulously planned clinical studies.

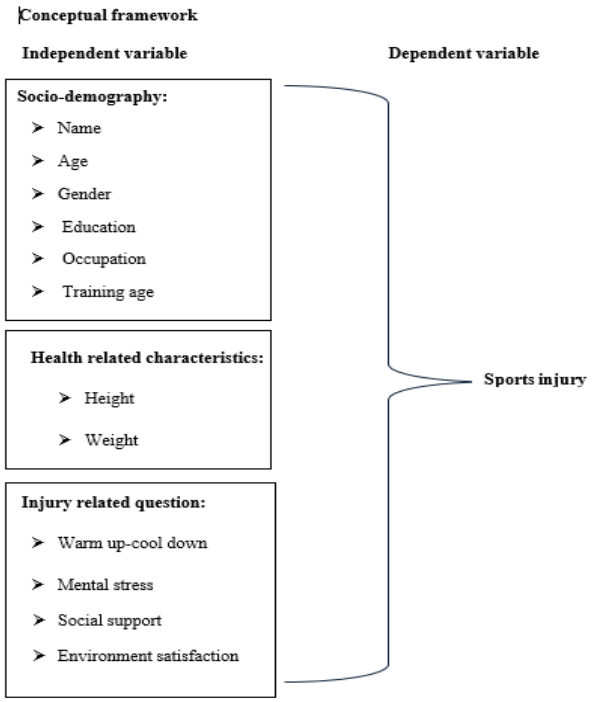
Almost 1.3 million female athletes in the United States experienced sports injuries in 2002. 53% of those might be self-treated or left untreated since they were minor. Nonetheless, 1 million Americans get medical care each year for sports-related injuries. That's roughly 26 per 1,000 persons [10-12]. Athletes who play contact sports and dancing has the highest injury rates for dancing they require, special technique and tactics, while the most severe wounds are connected to solitary pursuits. The most common sports-related trauma in the United States is baseball and athletics, with 68% of injuries coming from ball contact, player-player collisions, or being struck by an object [13].

Athletic trainee injuries are frequent, and the training authority frequently ignores them. In comparison to male athletes, female athletes are less prevalent globally and put less effort into their training, practice, and competition schedules [14]. In order to improve a female athlete's athletic performance, this study aims to assess the value of establishing pre- participation physical screening/examination procedures for female athletes in Bangladesh. These procedures include neuromuscular and proprioceptive training programs. As per [15], a female athlete's shoulder and knee are the most often injured areas. The treatment of athletes should start before any injuries happen, according to Evans et at, [16]. Bangladesh has been slower than other nations to address physiotherapy for female athletes. This study will also be useful in raising physiotherapists' awareness of the musculoskeletal issues that female athletes face and in providing them with a chance to work on their sporting backgrounds.

This study aims to examine the different kinds and prevalence of common sports injuries among female university athletes, specifically focusing on its impact of training load on injury risk and recovery results [17]. The investigation seeks at identifying specific factors that may predispose female athletes to injury by analyzing patterns in training volume and intensity. Furthermore, it seeks to evaluate successful treatment methods and rehabilitation regimens that facilitate optimal healing and preparation for return to play. The results intend to inform evidence-based interventions and provide customized injury prevention and rehabilitation programs for female collegiate athletes.

2. MATERIALS AND METHODS

This is based on measured events and empirical data, therefore directly pulling information from field experience rather than theoretical presumptions. Thirty respondents from Rajshahi University randomly participated in field-level interactions to gather primary data, therefore offering first-hand evidence and raw information. Designed with a well-structured questionnaire, participants' educational background, food habit, medical condition, etc included. Two primary qualitative data collecting methods used in the study were Focus Group Discussions (FGD) and Key Informant Interviews (KII). While FGDs helped group-based data collecting, so augmenting the data with many points of view, KIIs were face-to-face to obtain in-depth insights from important respondents. Their height and weight were measured in (SECA Stadiometer 213 Japan) [8]. As a secondary source, the literature review helped to frame results in line with past studies. This study method followed the most recent edition of the Declaration of Helsinki to guarantee moral guidelines and participant welfare.



3. Data Processing and Analysis

The SPSS (IBM Corp. Released 2017. IBM SPSS Statiktikse for Windows, Version 25.0. Armonk, NY:

IBM Corp.) software was used to conduct all statistical analyses for this study and MS Excel is used for graphs and charts.

4. RESULTS

4.1. Descriptive Characteristics of Participants

The study sample includes 30 female university athletes aged between 21 and 26 years (Mean ± SD) (23.03 ± 1.25) Yr. The participants' body weight ranges from 47 kg to 69 kg, with a mean of 55.47 kg and a standard deviation of 5.93 kg. The heights of the athletes vary from 152.40 cm to 175.26 cm, with an average height of 162.02 cm and a standard deviation of 5.39 cm. The BMI values range from 17.61 to 25.73 with a mean of 21.13 and a standard deviation of 2.06 as Table.1

Table1. Descriptive Characteristics of Participants.

Total=30 (100%)	Minimum	Maximum	Mean	Std.Deviation
Age	21.00	26.00	23.03	1.25
Weight	47.00	69.00	55.47	5.93
Height	152.40	175.26	162.02	5.39
BMI	17.61	25.73	21.13	2.06

The bar graph shows that the highest number of injured participants20% are handball trainee, in athletics and volleyball equal percent 20% of injured trainee, in football 13%,in cricket 17% percent injured trainee, and 10% percent table tennis injured participant.

4.2. Duration of training in a day

Among the 30 participants who are injured, in this graph bar higher number of training pried 40% participant 180 minutes' trainee in a day,33.3% participant 120 minutes, 10% participant 150 minutes,6.7 % participant 90 minutes and 3.3% participant 210 and 240 minutes equal trainee in a day.

4.3. Resting time during training event

The bar graph shows, the higher number of resting time during trainee 26.7% equal 10 minutes and 20 minutes ,16.7% are 30 minutes rest,13.3% 5 minutes ,3.3% together 40,25,15,2,3 minutes rasting time during trainig event.

4.4. Type of injury

Participant of university level were most commonly affected by direct injury 77% and others were affected by indirect injury 23%

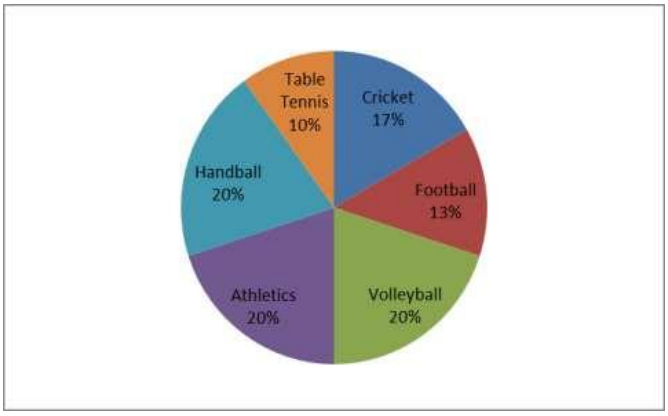


Figure1. Types of game in training event of injured participants

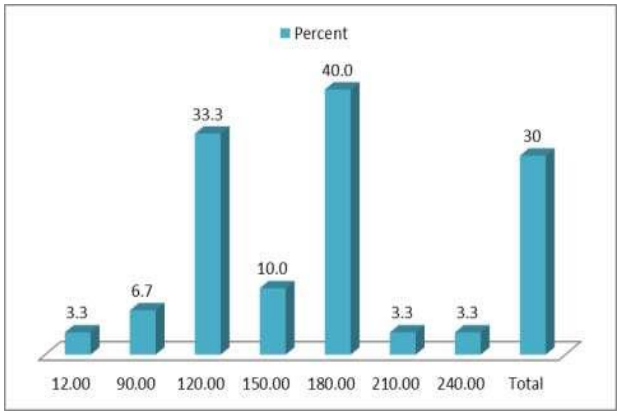


Figure 2. Duration of training in a day

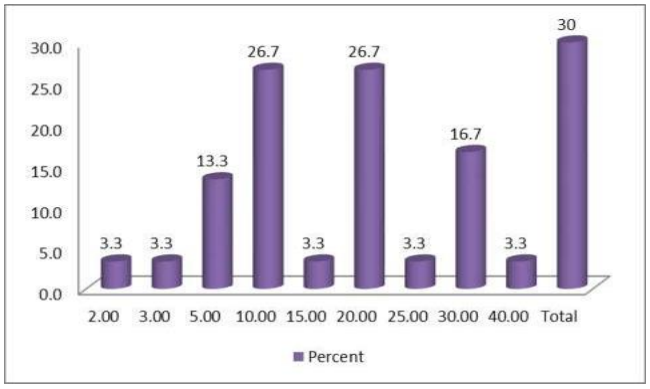


Figure 3. Resting time during play

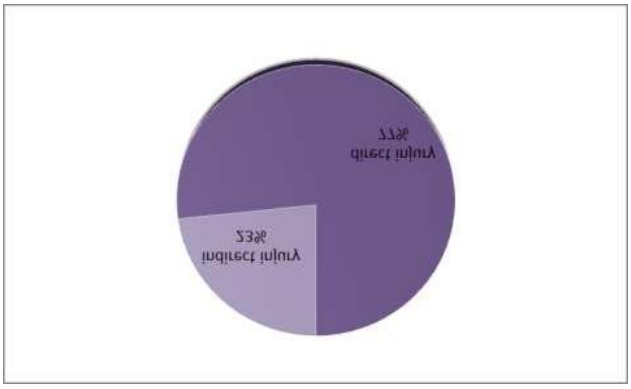


Figure 4. Type of injury

4.5. Severity of injury

The participants were mostly 57% moderate injured,13% mild and 30% severe injured

4.6. Injury of participant

Among all 30 participants higher number 26.7% participant injured by knee (ligament tear), 10% together shoulder, wrist, ankle pain,13.3% equal abrasion carpals and tarsals ,6.7% hamstring and shine pain equal injured,3.3% stress fracture injured.

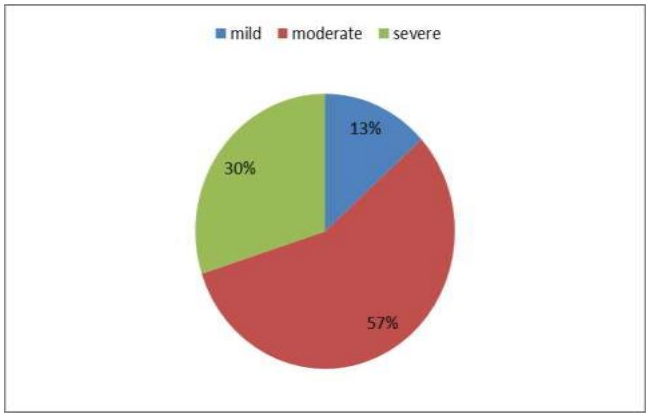


Figure 5. Severity of injury

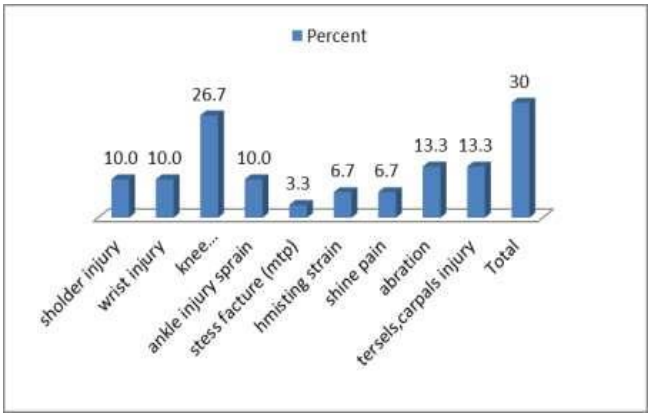


Figure-6: Position of injury

4.7. Types of treatment

The participant was mostly 63% taken physiotherapy,17% taken medicine, and 20% taken both physio and drug.

4.8. Improvement of after taken drug, physiotherap

The participant was mostly 25% improved, 17% unchanged and 8% not applicable after taken medicine treatment. And 22% improved 8% unchanged after taken physiotherapy treatment.

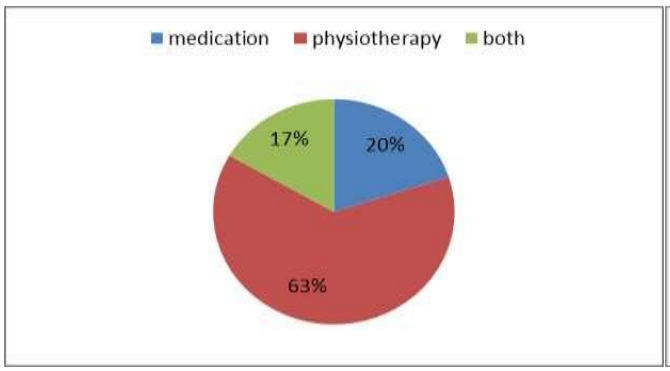


Figure-7. Type of treatment

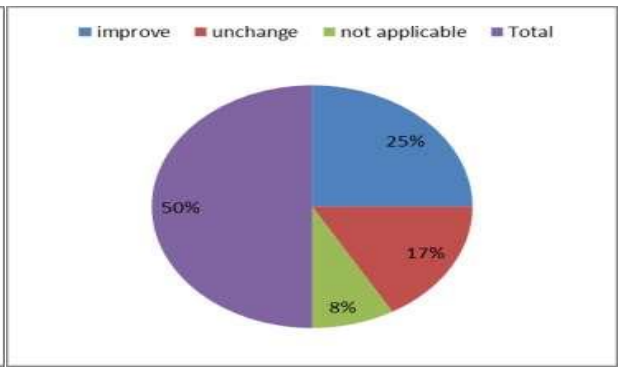


Figure-8. Improvement of after taken medicine treatment

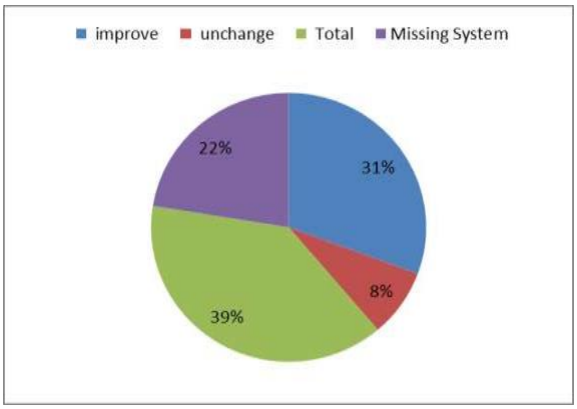


Figure-9. Improvement of injury after taken physiotherapy

5. DISCUSSION

The average age of injured participants in this study was 12, with 33% falling within the 15-20 age range and 20% falling within the 10-14 age range. In equestrian trauma, age group affected the types of injury; head injuries were common at all ages [18]. Among all the patients, the head (26.1%) was the most often injured body part. By age category, among the most often occurring injuries were concussions in 19 to 49 year olds, rib fractures in 50 years or older, and 0 to 18 year old upper extremity fractures [19].

Athletics, handball, and volleyball players accounted for 20% of all injuries, while football players represented 17% of injured trainees. Cricket players comprised 13% of the injured, and tennis trainees made up 10% of those injured. Out of 16,998 exposures, 147 were recorded as injuries in collegiate track and field jumping events. The most common types of injuries were lateral ankle and posterior thigh injuries [20]. Another study reviled that there were 2.20 injuries for every 1000 athlete exposures, with a greater rate of injuries during competitions (injury rate ratio = 1.73; 95% CI = 1.51, 1.97). On the other hand, the most common injuries were lateral ligament complex tears (4.2%), medial tibial stress syndrome (5.4%), and hamstring tears (8.9%) [21].

The results indicate that a higher incidence of knee or ligament injuries is observed among female athletes who do not engage in proper warm-up and cool-down routines. Additionally, those who play for a duration of 120 minutes per day exhibit a higher level of injuries compared to those playing for 210 and 240 minutes, which are associated with lower injury levels. Overtraining is a detrimental condition for athletes, leading to weakened muscles, joints, and overall nervous system function. This is particularly concerning for female athletes, who may experience injuries more rapidly as a result of overtraining [22,23].

Another major thing notice that menstrual disturbance mostly affected female athletes also affected the incidence of injury in women during the ovulatory phase of the menstrual cycle, when rise in oestrogen production occurs and the epidemic of noncontact ACL tears in female athletes may be attributed to hormonal variations [24]. Commonly classified as either primary or secondary athletic amenorrhea, this condition is brought on by abnormal hormone levels in the hypothalamus. Common injuries of female athlete affected varies types of injuries mostly their lacks of weakness, proper nutrition, eating healthy food, and proper way to practicing.

Our study suggests that the risks of injury that are associated with the sport's nature. Trainees are significantly more relying on physiotherapy than on medication following an injury. In our study recommended that female athletes enhance their flexibility by practicing a thorough warm-up and cool-down, adhering to the diet chart and ensuring that they have a complete nutritional and water resistance. The study's findings illustrate the frequency of injury among female athletes, the characteristics of athletic injury and the factors that are associated with injury in female athletes.

6. Limitations and future directions

The main restrictions of this study are its small sample size and the deliberate sampling technique, which might restrict the ability to generalize of the results to all female university athletes. The study also mostly depends on self-reported data, which can introduce bias since individuals might not precisely remember or document their injury details or degree of severity.

The results of this study indicate that future studies should explore the particular processes of injury among female university athletes in various sports, so increasing the sample size to encompass a more varied demographic for a more thorough investigation. A longitudinal method would help one monitor changes in injury occurrence and recovery over time. Future research should also investigate the psychological effects of injuries on sportsmen and the efficacy of different rehabilitation approaches, including wearable gadgets to track healing and stop injuries. More specific and efficient injury prevention and treatment strategies resulting from this could improve athlete safety and performance by means of their effectiveness.

7. Conclusion

In university level the largest area to explore talents in sports, also give opportunity to play in different national or international competitions. The result of the study indicates participants of university level female athlete were most commonly affected by direct or overuse injury rather than indirect injury. Variation in anatomical body structure (height, weight) and fitness training duration are the primary factors of their injury, knee (ligament), abrasion, carpals-tarsals are the frequent injured. The study indicates lower flexibility is another risk factor for athletes and the participants who have trained for long duration have less injury rate. The injury risks associated with the nature of the sport. Trainees are highly dependent on physiotherapy rather than medicine after injury. The project work proposed the following recommendation to female athlete improver their flexibility proper warm and cool down, practicing for proper way, follow the diet chart to gets their nutritional and water resistance completely. And the result of the study demonstrates the frequency of injury among female athletes, characteristics of athletic injury and factors associating injury in female athletes. In this study only prevalence of injury identified it can be more specified if and effectiveness of physiotherapy treatment also done among female athletes which might be play an vital role in improving the professional efficacy.

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Conflict of Interest

No conflict of interest is declared by the authors. In addition, no financial support was received.

Author Contributions

Study Design, AA,TT; Data Collection,TT, AA; Statistical Analysis, AA, TT; Data Interpretation, AA; Manuscript Preparation, AA, TT; Literature Search, AA, TT. All authors have read and agreed to the published version of the manuscript.

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